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THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent application of :

Hyun-Suk YANG :

Group Art Unit 3652

Serial No. ~~10/092,394~~ 10/092,349 :

Examiner T. Brahan

Filed March 7, 2002 :

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RETICLE TRANSFER SYSTEM :

GROUP 3600

REQUEST FOR RECONSIDERATION UNDER 37 CFR 1.111

U.S. Patent and Trademark Office
2011 South Clark Place
Customer Window, Mail Stop AF
Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202

Sir:

The Office Action of April 13, 2004 and the references cited therein have been carefully studied and reviewed, and in view of the following representations, reconsideration is respectfully requested.

The present invention relates to a **reticle** transfer system for transferring reticles used in a photolithographic process. Applicant's claims 1 and 4 each recite a reticle transfer system comprising a fork arm, and position sensors 31 located on the base ends of the tines 27a of the fork arm 27, respectively. Accordingly, the sensors 31 enable the detection of the presence of a reticle at a given position relative to the

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tines. In particular, the sensors 31 enable the detection of an abnormal position (ABNRM in FIG. 3) in which a reticle is spaced from the base ends of the tines.

Nakahara et al. do teach a reticle transport and storage system comprising a fork arm 3, corresponding to that of Applicant's admitted prior art of FIG. 1. That is, the fork arm 3 comprises a base, and a plurality of tines extending from the base. However, as noted by the Examiner, Nakamura et al. do not teach position sensors disposed on the fork arm 3.

Swanson et al. (USP 5,298,939) do not disclose a reticle transport system similar to that of Nakahara et al. Swanson et al. disclose a photolithographic machine (FIG. 2) for transferring an image of a reticle 201, mounted on the top of a stage 116, onto a substrate 203 supported on the bottom of the stage 116. However, Swanson et al. fail to teach any reticle transport system associated with their machine. In this respect, please refer to col. 4, lines 29, 30 where Swanson et al. merely state that a "reticle...is loaded by the user on the top of stage 116".

Thus, there is nothing in Swanson et al. concerning the transferring of the reticle 201 to the stage 116 that would have motivated one of ordinary skill in the art to have modified the reticle transport and storage system of Nakahara et al.

In the Office Action, though, the Examiner refers to end effector 106 having optical sensors 700. However, this end effector 106 is for use in transferring the substrate 203, and not the reticle 201, to the stage 116. Moreover, the optical sensors are provided on the end effector of the substrate transfer system for a reason that is

inapplicable to the transfer system of Nakahara et al. Swanson et al. teach that the linear arrays of optical sensors 700 are provided on the substrate effector 106 for helping pre-align the substrate in the machine in the yaw direction (col. 17, lines 11 – 17).

It is axiomatic that for the Examiner to establish a *prima facie* case of obviousness in a rejection under 35 USC 103, based on a combination of references, that the references must provide some suggestion that would have motivated one of ordinary skill in the art to have combined the references in a manner resulting in the claimed invention. MPEP 2142. However, the new statement of the rejection by the Examiner in par. 2 on Page 2 of the Office Action lacks an indication of any suggestion that would have motivated one of ordinary skill in the art to have modified the Nakahara et al. apparatus in view of the teachings of Swanson et al. Thus, the Examiner still has not established a *prima facie* case of obviousness.

Nonetheless, the Examiner apparently acknowledged these requirements by withdrawing the previous rejection based on the combining of the Nakahara et al. and Holbrooks references in light of the arguments set out in the Amendment of December 18, 2003 that the measuring of the size of a substrate is inapplicable to reticles. In a similar vein, it is also respectfully submitted that the reticles in transfer systems of the type disclosed by Nakahara et al. are not pre-aligned during their transfer in the direction of yaw. Accordingly, the above-mentioned teachings of Swanson et al. relied on by the Examiner, i.e., the pre-aligning sensors 700 of the

substrate transfer system, would not provide any suggestion that would have motivated one of ordinary skill in the art to have modified the reticle transfer system of Nakahara et al.

For this reason as well, the rejection based on the combining of the substrate transfer system of Swanson et al with the reticle transfer system of Nakahara et al. should be withdrawn.

Genov (USP 6,085,125) teaches an end effector 70 having a plurality of proximity sensors 72a, 72b and 72c . The Examiner concludes that it would have been obvious to have incorporated these sensors onto the base ends of the tines of the fork arm of Nakahara et al. However, as in the rejection discussed above, the statement of the rejection by the Examiner at the end of par. 3 on Page 3 of the Office Action lacks any indication of the suggestion to modify the Nakahara et al. apparatus in view of the teachings of Genov. Thus, the Examiner has not established a *prima facie* case of obviousness.

Applicant also respectfully contends that there is simply no suggestion that would have motivated one of ordinary skill in the art to have combined the references **in a manner resulting in the claimed invention**. In particular, there is no suggestion that would have motivated one of ordinary skill in the art to have placed the proximity sensors 72a, 72b and 72c on the base ends of the tines of the fork arm disclosed by Nakahara et al.

In this respect, it is to be noted that, as mentioned above, the sensors of the present invention are provided on the base ends of the tines of the 27a of the fork arm so as to basically sense for the absence of a reticle and thereby detect the abnormal positioning of the reticle on the fork arm.

In Genov, the main purpose of the proximity sensors 72a, 72b and 72c is to pre-align the end effector 70 in the z-axis direction using a reference surface. The relative locations of the sensors 72a, 72c on the tines of the so-called fork arm can hardly be discerned from FIG. 6, nor does Genov offer a written description of any importance attached to where such sensors should be located along the tines to achieve this aim of pre-aligning the end effector in the z-axis direction. Just as importantly, though, if anything, Genov teaches that such proximity sensors should be located under the substrate S when the substrate S is positioned normally relative to the end effector 70, as illustrated in FIG. 6.

With this in mind, Applicant respectfully submits that even assuming, *arguendo*, that one of ordinary skill in the art would have somehow been motivated to have incorporated the proximity sensors 72a, 72b and 72c of Genov onto the fork arm of Nakahara et al., that person would have only been led to place the sensors on the distal ends of the tines fork arm, i.e., away from the base ends of the tines, so that the proximity sensors could sense, for example, when the fork arm was proximate a reticle disposed in a reticle cassette. Such a combination would be different from Applicant's claimed invention.


The remaining references to Johanson et al. and Holbrooks, relied on to reject Applicant's dependent claims, have been studied but are not seen to provide the requisite suggestion that would have motivated one of ordinary skill in the art to have combined the references in a manner resulting in Applicant's invention of claims 1 or 4.

For these reasons, namely because of the differences between Applicant's invention, as is now claimed, and the references, including the lack of suggestion in the references of a fork arm of a reticle transfer system wherein position sensors are disposed on the base ends of the tines of the fork arm, respectively, to enable the detection of an abnormal state wherein the reticle is spaced from the base ends of the tines, it is seen that the references do not render obvious the subject matter of Applicant's claims 1 and 4 when such subject matter is considered as a whole and the references are considered for what they actually suggest. Accordingly, early reconsideration and allowance of the claims are respectfully requested.

Respectfully submitted,
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